

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PA1770WO	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/FR2004/002184	International filing date (<i>day/month/year</i>) 24.08.2004	Priority date (<i>day/month/year</i>) 29.08.2003
International Patent Classification (IPC) or national classification and IPC B81B3/00		
Applicant COMMISSARIAT A L'ENERGIE ATOMIQUE		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:

- a. ☒ (sent to the applicant and to the International Bureau) a total of 3 sheets, as follows:
- ☒ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
- ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

- b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s))

_____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FR2004/002184

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This report is based on translations from the original language into the following language _____ which is the language of a translation furnished for the purposes of:
 - ☐ international search (Rule 12.3 and 23.1(b))
 - ☐ publication of the international application (Rule 12.4)
 - ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
 - ☐ the international application as originally filed/furnished
 - ☒ the description:
 - pages 1-10 _____ as originally filed/furnished
 - pages* _____ received by this Authority on _____
 - pages* _____ received by this Authority on _____
 - ☒ the claims:
 - nos. _____ as originally filed/furnished
 - nos.* _____ as amended (together with any statement) under Article 19
 - nos.* 1-10 _____ received by this Authority on 14.04.2005 with letter of 11.04.2005
 - nos.* _____ received by this Authority on _____
 - ☒ the drawings:
 - sheets 1/6-6/6 _____ as originally filed/furnished
 - sheets* _____ received by this Authority on _____
 - sheets* _____ received by this Authority on _____
 - ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
 - ☐ the description, pages _____
 - ☐ the claims, nos. _____
 - ☐ the drawings, sheets/figs _____
 - ☐ the sequence listing (specify): _____
 - ☐ any table(s) related to sequence listing (specify): _____
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
 - ☐ the description, pages _____
 - ☐ the claims, nos. _____
 - ☐ the drawings, sheets/figs _____
 - ☐ the sequence listing (specify): _____
 - ☐ any table(s) related to sequence listing (specify): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FR2004/002184

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1-10</u>	YES
	Claims	<u></u>	NO
Inventive step (IS)	Claims	<u>2-6, 8, 9</u>	YES
	Claims	<u>1, 7, 10</u>	NO
Industrial applicability (IA)	Claims	<u>1-10</u>	YES
	Claims	<u></u>	NO

2. Citations and explanations (Rule 70.7)

1. The following documents are mentioned in the present report; the numbering given below will be used throughout the rest of the procedure:

D1: US-A-5334342

D2: US-A-6277756

D3: WO-A-0109579*

* D3 is cited in the international search report.

2. The present application fails to meet the requirements of PCT Article 33(1), since the subject matter of claims 1 and 7 does not involve an inventive step as defined by PCT Article 33(3).

- 2.1 D1, which is considered to be the prior art closest to the subject matter of claim 1, describes (cf. in particular figure 6L and the corresponding text and column 8, lines 40 to 59) a micromechanical device comprising in combination all the technical features of claim 1. The micromechanical device (cf. figure 6L) comprises at least one suspended element (80) attached to a substrate (62) by a pillar having a base and a

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	<p>top (cf. "central hub" 80). The substrate comprises a recess etched into a substrate and opening onto the surface of the substrate opposite the suspended element (cf. the recess created by etching: column 9, lines 48 to 52 and figure 6G); said recess has at least one broadened area of which the cross-section is greater than that of the recess at said surface; the base of the pillar, shaped to match the recess, is embedded therein (cf. figure 6L).</p> <p>Consequently, the subject matter of claim 1 differs from this known device in that at least two broadened areas of the recess consist of at least two vertically adjacent grooves and the base of the pillar comprises at least two ribs matching said grooves.</p> <p>The problem that the present invention is intended to solve can therefore be considered to be that of producing an alternative recess to the one described in D1. This feature is merely one of several obvious options that a person skilled in the art seeking to solve the stated problem might select, depending on each particular case, and without an inventive step being involved (cf. D2, figures 7A to 7I: a recess is formed with grooves). A person skilled in the art might select the recess described in D2, for example, to provide a more stable anchoring area than the one described in D1.</p> <p>2.2 Claim 7 differs from the original claim 9 (cf. claim 1 paragraphs 2.2) in that the grooves are produced by alternating steps of C4F8 passivation and SF6 etching.</p>

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FR2004/002184

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
	<p>These additional features are known from D2 (cf. column 7, lines 12 to 29) and therefore do not confer inventiveness on claim 7</p> <p>2.3 Furthermore, claims 1 and 7 do not involve an inventive step relative to D3 and D2.</p> <p>D3 describes (cf. in particular figures 14a to 14h and the corresponding text) a micromechanical device (cf. figure 14h) comprising at least one suspended element (378) attached to a substrate (350) by a pillar (371) having a base and a top. The substrate comprises a recess (370) etched into a substrate and opening onto the surface of the substrate opposite the suspended element; the base of the pillar, shaped to match the recess, is embedded therein (cf. figure 14h).</p> <p>Consequently, the subject matter of claim 1 differs from this known device in that:</p> <ul style="list-style-type: none">(i) the recess has at least one broadened area of which the cross-section is greater than that of the recess at said surface;(ii) at least two broadened areas of the recess consist of at least two vertically adjacent grooves and the base of the pillar comprises at least two ribs matching said grooves. <p>The problem that the present invention is intended to solve can be considered to be that of providing an alternative <i>deep</i> recess to the one described in D1. This feature is merely one of several obvious options that a person skilled in the art seeking to solve the</p>

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FR2004/002184

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;
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stated problem might select, depending on each particular case, and without an inventive step being involved (cf. D2, figures 7A to 7I: a recess is formed with grooves). A person skilled in the art might select the recess in D2, for example, to provide a deeper recess than the one described in D3. The method of D2 produces a recess with grooves and ribs and the oxide film does not have the effect of smoothing the walls of the recess.

Claim 7 describes well-known steps for producing the micromechanical device according to claim 1 and does not therefore involve an inventive step.

3. Claims 2 to 6, 8 and 9 meet the requirement of novelty, involve an inventive step and are industrially applicable (PCT Article 33).